

What Is Claimed Is:

1. A method of modulating data supply time, comprising the steps of:
 - deriving a light transmittance versus time characteristic during a change of each gray level to another gray level in a liquid crystal display panel;
 - deriving a transition time when each gray level is changed to another gray level on a basis of light transmittance versus time characteristic; and
 - modulating a supply time of data supplied to the liquid crystal display panel in accordance with the transition time.
2. The method according to claim 1, wherein the step of deriving the transition time comprises:
 - deriving an upward transition time from a transmittance corresponding to a middle gray level value to a transmittance corresponding to an uppermost gray level value in an expressible gray level range; and
 - deriving a downward transition time from the transmittance corresponding to the middle gray level value to a transmittance corresponding to a lowermost gray level value in the expressible gray level range.

3. The method according to claim 2, further comprising the step of determining an extent of variation of the data input to the liquid crystal display panel.
4. The method according to claim 3, further comprising the step of selecting any one of the upward transition time and the downward transition time in accordance with the extent of variation of the data input to the liquid crystal display panel.
5. The method according to claim 3, wherein the step of modulating the supply time of the data comprises modulating the supply time of the data in accordance with the transition time selected from the upward transition time and the downward transition time.
6. A driving method of a liquid crystal display device, comprising the steps of:
 - receiving current data;
 - delaying the current data;
 - comparing the delayed current data with the received current data; and
 - controlling a supply time of the data differently in accordance with a comparison result of the data.

7. The driving method according to claim 6, wherein the step of controlling the supply time of the data differently comprises:

deriving a light transmittance vs. time characteristic when each gray level is changed to another gray level in a liquid crystal display panel of the liquid crystal display device;

deriving an upward transition time from a transmittance corresponding to a middle gray level value to a transmittance corresponding to an uppermost gray level value in an expressible gray level range of the liquid crystal display panel;

deriving a downward transition time from the transmittance corresponding to the middle gray level value to a transmittance corresponding to a lowermost gray level value in the expressible gray level range;

selecting any one of the upward transition time and the downward transition time in accordance with the comparison result of the data; and

modulating a supply time of the data in accordance with a transition time selected from the upward transition time and the downward transition time.

8. A driving method of a liquid crystal display device, comprising the steps of:

receiving current data;

delaying the current data;

comparing the delayed current data with the received current data;

selecting any one of an uppermost gray level data and a lowermost gray level data among gray level values of the data in accordance with a comparison result; and

supplying the data selected between the uppermost gray level data and the lowermost gray level data to a liquid crystal display panel of the liquid crystal display device.

9. The driving method according to claim 8, further comprising the step of differently controlling a supply time of the data supplied to the liquid crystal display panel in accordance with the comparison result.

10. The driving method according to claim 9, wherein the step of controlling the supply time of the data differently comprises:

deriving a light transmittance vs. time characteristic when each gray level is changed to another gray level in the liquid crystal display panel;

deriving an upward transition time from a transmittance corresponding to a middle gray level value to a transmittance corresponding to an uppermost gray level value in an expressible gray level range of the liquid crystal display panel;

deriving a downward transition time from the transmittance corresponding to the middle gray level value to a transmittance corresponding to a lowermost gray level value in the expressible gray level range;

selecting any one of the upward transition time and the downward transition time in accordance with the comparison result; and

modulating a supply time of the data in accordance with a transition time selected from the upward transition time and the downward transition time.

11. A driving apparatus of a liquid crystal display device, comprising:

a liquid crystal display panel of the liquid crystal display device;

a lookup table for storing a transition time on a basis of a light transmittance versus time characteristic when each gray level is changed to another gray level in the liquid crystal display panel; and

a time modulator for modulating a supply time of data supplied to the liquid crystal display panel in accordance with the transition time.

12. A driving apparatus of a liquid crystal display device, comprising:

a memory for delaying received current data;

a lookup table comparing the delayed received current data with the received current data; and

a controller for differently controlling a supply time of the data in accordance with a comparison result of the data.

13. The driving apparatus according to claim 12, wherein the lookup table stores:

an upper transition time from a transmittance corresponding to a middle gray level value to a transmittance corresponding to an uppermost gray level value in an expressible gray level range; and

a downward transition time from the transmittance corresponding to the middle gray level value to a transmittance corresponding to a lowermost gray level value in the expressible gray level range.

14. The driving apparatus according to claim 13, wherein the lookup table selects any one of the upward transition time and the downward transition time in accordance with the comparison result of the data.

15. The driving apparatus according to claim 14, wherein the controller modulates a supply time of the data in accordance with the selected transition time.

16. A driving apparatus of a liquid crystal display device, comprising:
- a memory delaying received current data;
 - a lookup table for comparing the delayed received current data with the received current data;
 - a selector for selecting any one of an uppermost gray level data and a lowermost gray level data among gray levels of the data in accordance with a comparison result; and
 - a data supplier for supplying the data selected from the uppermost gray level data and the lowermost gray level data to a liquid crystal display panel of the liquid crystal display device.
17. The driving apparatus according to claim 16, further comprising a controller for differently controlling a supply time of the data in accordance with the comparison result.
18. The driving apparatus according to claim 17, wherein the lookup table stores:
- an upper transition time from a transmittance corresponding to a middle gray level value to a transmittance corresponding to an uppermost gray level value in an expressible gray level range of the liquid crystal display panel; and

a downward transition time from the transmittance corresponding to the middle gray level value to a transmittance corresponding to a lowermost gray level value in the expressible gray level range.

19. The driving apparatus according to claim 18, wherein the lookup table selects any one of the upward transition time and the downward transition time in accordance with the comparison result.

20. The driving apparatus according to claim 19, wherein the controller modulates a supply time of the data in accordance with a transition time selected from the upward transition time and the downward transition time.